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ABSTRACT

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Performance Indicators in Postsecondary Education in Alberta: An Analysis

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Jean Endo
Editor
AIR Forum Publications

Abstract

This paper analyzes the current proposals by the government of Alberta, Canada to implement an accountability framework for the province's postsecondary institutions using performance indicators. The paper develops a conceptual framework for performance indicators based on a discrepancy model of evaluation using three metaphors: mechanical, medical, and economic. This is followed by a critical examination of performance indicators with a delineation of potential weaknesses and strengths as well as recommendations for practice. Finally, the Alberta plan is used as a case study to illustrate the concepts developed in the paper.

The paper argues that the Alberta plan for performance indicators in the public postsecondary sector reflects an economic metaphor of performance indicators which will result in measuring fiscal effectiveness as opposed to educational effectiveness. Further, the paper argues, while the Alberta government has indicated that the performance indicators will allow for inter- and intra-sectoral variations, no allowances seem to have been made for a value-added assessment of student outcomes which is at the heart of the purpose for postsecondary educational institutions.

In March 1994 the Alberta Department of Advanced Education and Career Development produced its first Three-year Business Plan (1994b). At the same time the department was in the final stages of completing a review of its mission and mandate which included significant public consultation and input. New Directions for Adult Learning in Alberta (Alberta Advanced Education and Career Development, 1994a; hereafter referred to as New Directions), the policy paper which resulted from that review, was published in October 1994. These two documents emphasized accountability. This thrust was in keeping with government actions to develop and publish performance indicators (PIs) in all government departments. The government has consistently trumpeted its use of a business approach to governing.

New Directions outlined four goals which the department set for itself with respect to Alberta's postsecondary education sector. The goals were to increase accessibility, responsiveness, affordability, and accountability. Within the scope of the accountability goal the policy paper indicated the government intends to "require [education] providers to measure and report on performance through an accountability framework to advise Albertans of results achieved in publicly funded learning opportunities" (p. 16). Reporting, the policy paper said, is to be done by PIs.

Since New Directions was published the department of Advanced Education and Career Development has been working with the postsecondary sector to develop these PIs. As has often been the case in other jurisdictions, the process has been long and difficult. The initial plan was to have PIs implemented in 1995/96 (Alberta Advanced Education, 1994b); but 1995/96 has become a year for piloting and implementation has been put off for another year. However, the government has

shown the political will to proceed with implementation. A key question postsecondary institutions in Alberta had to answer was the degree to which they would cooperate so as to have input into the creation of the accountability framework. Given the track record of the government in reforming the health and education sectors, if the postsecondary institutions had not participated, it is likely that the government would have proceeded to impose a set of PIs—some of which might not have been in the best interests of some institutions.

Why the flurry of activity to develop PIs and implement them within so quickly? What are PIs and are they applicable to Alberta's postsecondary system? This paper explores these questions by presenting a conceptual framework for PIs and examining the nature of the proposed Alberta PI system in the light of the framework. The conceptual framework uses three metaphors to explain the basis for PIs.

The Alberta Context

It is helpful to provide context for this paper by briefly describing the postsecondary system in Alberta. Alberta has a population of 2.4 million. Its citizens are served by four universities, 11 community colleges, two institutes of technology, four government administered vocational colleges, and the Banff Centre for Continuing Education. Four community education consortia, 85 community adult learning councils, a wide range of private colleges, and more than 90 licensed private vocational schools complement the traditional educational institutions (Andrews & Elford, 1996).

Conceptual Basis for Performance Indicators

PIs in higher education developed as an outgrowth of the outcomes assessment movement of the last decade. Ewell (1983) defined student outcomes "as any change or consequence occurring as a result of enrollment in a particular educational institution and involvement in its programs" (p. 11). Easley (1987) further clarified what is meant by student outcomes assessment by defining assessment as "the process of locating evidence to show that specific or general outcomes have been achieved by the students" (p. 10). Ewell also pointed out that student outcomes assessment as developed in the last 30 years "views the assessment of outcomes as part of the process of rational resource allocation and program decision making" (p. 4). Outcomes assessment and, thus, PIs are rooted in a rational systems approach to organizations.

According to the systems model institutions ought to develop goals that determine the outcome for which they strive. It then follows that organizations should evaluate the degree to which they attain those goals. Outcomes assessment techniques are used to provide information on the degree of congruence between intended student outcomes and actual student outcomes. This information in turn provides feedback to guide the curricular decisions. This process, which is similar to Provus' (1971) discrepancy evaluation model, is outlined in Figure 1.

The concept of PIs can been illustrated using mechanical, medical, and economic metaphors. In education PIs can be understood as attempting to demonstrate the effectiveness and efficiency of an institution in attaining its goals similar to the way gauges and lights are used show the efficient or effective operation of a motor,

instruments the health of a person's body, or statistics the state of an economic enterprise be that a company or a nation.

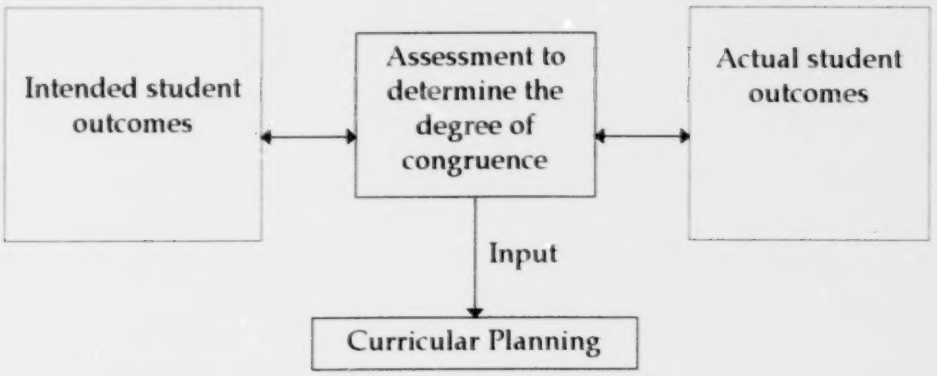

Figure 1. Relationship between Intended Student Outcomes, Student Outcomes, and Curricular Planning

Mechanical Metaphor

Nuttall (1994) argued that educational PIs are like mechanical monitors. His emphasis was on the use of feedback to monitor efficiency and effectiveness. Parallels can be drawn to educational PIs by considering the kind of monitors we use for an automobile. Direct observation of the mechanical aspects of a car is not possible while driving. Therefore, automotive engineers have designed instruments which measure certain characteristics and provide proxy indicators of its performance. Immediate feedback is important to monitor some features of a car's performance. Other PIs can be checked at certain intervals. However, both kinds of monitors are, in effect, formative evaluation tools which provide information to guide decisions about the need for closer examination. As Nuttall said,

> they act as an early-warning system that something may be going wrong, in the same way that the instruments on the dashboard of a car can alert the driver to a problem or reassure him or her that everything is functioning smoothly. A dial pointer moving into the red zone is only a symptom of some malfunction and further investigation is needed to establish the cause. (p. 17)

PIs in automobiles include such things as the rate of fuel consumption, engine temperature, brake line pressure, and tire wear patterns. From these PIs we can infer something about past, present, or future performance. Nuttall (1994) also pointed out that "if something is wrong, the indicators themselves do not provide the diagnosis or prescribe the remedy; they are simply suggestive of the need for action" (p. 17). In a similar fashion, one intended use of educational PIs is to provide information which may give an indication of the efficiency or effectiveness of an educational system and alert people if there is the need for further attention.

Medical Metaphor

The medical diagnosis metaphor is also helpful in understanding PIs. Although direct examination is possible most medical practitioners try to be as non-invasive as possible because of financial costs as well as personal costs in time and comfort. Invasive surgical examinations for diagnostic purposes is inefficient. Instead, most diagnoses are made by proxy indicators such as temperature, white blood cell counts, or blood pressure.

The medical metaphor also provides insight into the use of PIs in education. Proxy indicators are used because of the difficulty, disruption, complexity, and cost of

direct examination. Furthermore, the idiosyncratic nature of those analyses would make inter-institutional comparison difficult if not impossible. As in medicine, norms—including ranges of acceptable deviation—as well as standard definitions and procedures are needed so that measures are comparable across institutions and time.

Economic Metaphor

Nedwek and Neal (1994) noted that many authors see a natural parallel between economic indicators and educational PIs. Economists generally describe the economic state of an organization or nation by reference to a few statistics. Cave, Hanney, and Kogan (1991) pointed out that each statistic is based on numerous components but is generally expressed in some quantitative measure. We are used to such national economic PIs as gross domestic product, consumer price index, stock market indices, balance of trade, government budget deficits, and unemployment rates. Those interested in corporate health look to corporate economic PIs such as unit cost of production, profit margin, cash flow, or debt to equity ratio.

As with the mechanical metaphor, economic PIs generally identify changes in effectiveness or efficiency. Nedwek and Neal (1994) observed that the economic PI approach has much support in higher educational institutions because of the frequent presence of corporate leaders on governing boards. To the extent that this same tendency is true in government circles, we might expect the economic metaphor to be applied to public postsecondary education institutions.

Medical and mechanical PIs tend to be criterion- or norm-referenced. Criterion-referenced systems have specific, predetermined targets against which performance is

judged. Norm-referenced systems use average performance of a larger group as the standard of performance. However, in economic PI systems the point of reference for interpretation tends to be past performance. Thus, economic PIs tend to be expressed as percentage or absolute value changes from some previous period (typically a quarter or year). In medicine and mechanics trends but cease to be important if the PI is within the normal or target range. It would be rare indeed to get economists to agree on what the normal range of unemployment or inflation should be.

Educational PI systems tend to possess aspects of all three metaphors. Enrollments, for example, are generally historically-referenced (e.g., change from the previous year); however, when expressed another way (e.g., student-faculty ratio) they may have a norm-reference or even criterion-reference (e.g., government funding targets) interpretation.

Windham (1990, as cited in Nuttall, 1994) drew attention to the fact that economic PIs are required to be "accurate, relevant, timely, understandable and affordable" (p. 34). Those who support the economic approach to PIs would likely agree to use such criteria in evaluating the adequacy and appropriateness of educational PIs. In order for PIs to be implemented and used to guide institutional policy decisions, such characteristics would appear to be appropriate.

Weaknesses of Performance Indicators

There are several potential weaknesses of PIs with respect to their use in postsecondary education which need to be guarded against both in Alberta and as the Alberta model may be applied in other jurisdictions. These are discussed below.

Economic Metaphor Bias

There is a tendency to apply only a single kind of PIs. In many cases, as Nedwek and Neal (1994) pointed out, the single metaphor used is the economic one which results in institutions measuring only fiscal health. They argued that most of the language relating to the design of PI systems has been drawn from industry, yet the nature of higher education, "with its dual system of control between administrative and professional cultures" is not sufficiently similar to allow for "direct application of the industrial input/output model" (p. 81). Astin (1991) argued convincingly that the true measure of an educational institutions effectiveness is its impact on the lives of students. In addition, universities have a second major function—research. An appropriate set of PIs for universities must include defensible PIs for research.

Sector Tensions

A system of PIs must allow for inter- and intra-sector variations. Inter-sector variations are those between different types of institutions. A system with universities, colleges, vocational and technical institutes, and private institutions, as in Alberta, presents different demands on a PI system than is the case for a uniform system. Too strong a concern with system-wide comparability of PIs can result in PIs which indicate nothing but similarities and bury the distinctiveness of each sector. On the other hand, a system which is premised on the uniqueness of each institution and each program may yield PIs which are so discrete that comparison is impossible.

Intra-sector variations are between different institutions within the same sector. Within its university sector, Alberta has one small regional university, a university

based on a distance-delivery model, and two large graduate research universities. Other jurisdictions may have differences resulting from program specialization or geographical variations. Similar challenges face the development of intra-sectoral PI systems as those identified for inter-sectoral systems. The difficulties involved in developing PI systems which can balance the inter-sectoral and intra-sectoral differences are considerable.

Variations in Interpretation

A third potential weakness of PIs is reflected in the argument for differentiated PIs. Interpretation of the meaning of a PI is subject to variations in expectations, worldviews, and interests. Different stakeholders may respond in opposite ways to the same PI depending on what they consider important. For example, students who want a close relationship with instructors might respond quite negatively to a student-faculty ratio of 50 to 1, whereas a provincial treasurer concerned with the cost of postsecondary education may say such a ratio is too low considering the infrastructure costs of large research university. The basis for interpretation of PIs is needs to be settled before implementing a system of PIs.

The criteria for evaluating student learning PIs must be clearly established because that is one of the key goals of postsecondary institutions. Halpern (1987) argued student outcomes should only be evaluated with respect to intended outcomes. A complicating factor is whether the intended outcomes to be considered should be those of the institution or the student.

Political expectations must be considered. Governments may want some PIs developed because of their political value rather than their ability to provide feedback on goal attainment by institutions or students. Governments seeking to reduce public expenditures may use the bottom line as the criterion for nearly everything they do, but providing a quality education is not the same as providing a quality education at the lowest possible cost – no matter how quality is defined. If the PIs focus on economics rather than academics, resulting actions will focus on the fiscal rather than the educational.

Over-Quantification

Nuttall (1994) observed that while there is disagreement on the definition of PIs, "it would seem that the more common view of indicators is of the quantitative variety" (p. 18). He pointed out that some writers limit the meaning to a narrow quantitative one as did Johnstone (1981) in saying "an indicator is . . . something which is quantifiable" (p. 4). Shavelson, McDonnell, Oakes, Carey, and Picus (1987) defined an indicator as "an individual or a composite statistic that relates to a basic construct in education and is useful in a policy context" (p. 5). However, they distinguished between statistics and indicators by noting that "statistics qualify as indicators only if they serve as yardsticks" to measure educational quality (p. 5).

Yet, many aspects of education goals resist quantification. Educational aims and outcomes are diffuse. How do we determine, and even if that is possible how do we express, in a meaningful way using numbers that students have grown in such aspects as civic responsibility as a result of the educational experiences they have had in an

institution? Yet, politicians and members of the public and the media who demand accountability seem to also be demanding quantification. The challenge is to provide meaningful information to those stakeholders while also generating insightful evaluative information for policy makers and practitioners.

Strengths of Performance Indicators

Nedwek and Neal (1994) identified these four positive benefits of PI systems: (a) monitoring the broad context of a policy, (b) providing benchmarks with relationship to specific goals, (c) predicting and/or providing early detection of emerging problems, and (d) providing explanations for existing problems. An additional benefit is the opportunity for enhanced rationality of decision-making.

Context Monitoring

In Total Quality Management terms, PIs can provide information which enable stakeholders to monitor the environment in the same way as economic PIs do for business. In the current competitive environment educational institutions need to have a means of tracking trends both internally within their various departments and externally in society and other comparable institutions.

Goal Attainment Indicator

Cave, et al. (1991) argued PIs provide information with respect to the degree to which desired outcomes have been achieved. Jacobi, Astin, and Ayala (1987) maintained outcomes assessment can be used at four critical points of the strategic planning process: (a) goal determination, (b) process refinement, (c) baseline data development, and (d) feedback on goal attainment. Similar to their use in the medical

and mechanical metaphors, PIs can summarize results from student outcomes assessment activities and provide information concerning goal attainment so that follow-up plans and actions can be implemented at the appropriate time.

Early Problem Detection

When PIs are used as process monitors they provide the opportunity to detect problems before they get out of control. The mechanical metaphor illustrates the value of PIs in providing early warning of variance from the accepted norms or standards. However, this requires clear delineation of the anticipated performance at critical stages of the process.

Problem Explanation

Problem explanation requires a different kind of information from what is needed for problem identification as illustrated in the mechanical metaphor. To the extent the medical diagnostic metaphor can be applied in education, PIs can provide information about aspects of a system which are performing abnormally such that understanding of the problem is possible. The key to such use rests in the development of a comprehensive set of norms for educational performance. Measurements and reports must be sufficiently detailed to provide the kind of information that will enable managers to identify problem components is a system. A government imposed PI system for a multi-sector postsecondary system would be unlikely to have the sophistication necessary to provide this kind of input. Such a system requires designers with specific experience and knowledge of the institutions and programs.

Enhancement of Rational Decision-Making

PIs attempt to increase the rationality of curricular decision-making by providing information regarding the functioning of the instructional/ curricular aspects of an institution. Writers vary in the degree to which decision-making is considered a rational process. At one end are those who support a rational approach like Saupe (1981) while at the other end are those like Cohen, March, and Olsen (1972) with their Garbage Can model of institutional decision-making. In between we can place Simon's (1993) bounded rationality model as well as political models and the various models emphasizing participation. Following Estler's (1988) categorization, decision-making models can be placed on a continuum (see Figure 2) with respect to the degree of rationality inherent in the process.

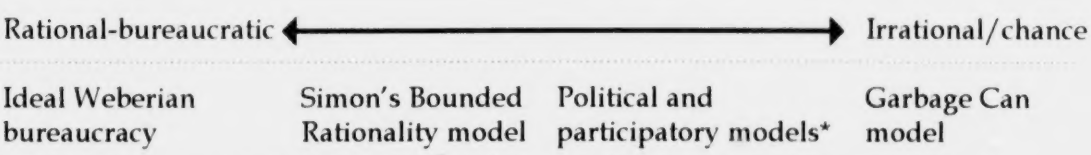
Rational-bureaucratic
Irrational/chance
Ideal Weberian bureaucracy
Simon's Bounded Rationality model
Political and participatory models*
Garbage Can model
*These models vary by the level at which the rationality occurs—group vs. Individual

Figure 2. Degree of Rationality of Decision-making Models

Rational decision-making is bounded, in Simon's terms, by several factors, but inadequate or inappropriate information is critical. It would be unreasonable to suggest that we will, or should, ever approach the Weberian ideal; however, appropriate and timely information can do much to assist decision-making. Providing appropriate and timely information is proposed as a fundamental function of PIs. Abuse of PIs for political purposes should not be allowed to negate their usefulness.

The Alberta Plan

History of Development

Alberta Advanced Education and Career Development has been seeking to develop a system of PIs for the postsecondary institutions since 1993. In the New Directions policy paper the department identified these three concerns with accountability practices as they existed in Alberta at that time: (a) no system-wide accountability approach with common definitions and comparability of information, (b) inadequate public access to information expenditures of tax money by postsecondary institutions, and (c) a lack of "current and objective information to assist [potential students] in making informed choices about opportunities to learn" (p. 16). In 1995 Alberta Advanced Education and Career Development (1995) indicated it was also concerned that existing performance measures and reporting procedures did not provide information at the program level, particularly fiscal information.

In December 1994 the presidents of the various public postsecondary institutions in Alberta agreed to 24 expected outcomes for which PIs would be developed (Larry Orton, personal communication, March 29, 1995). These outcomes relate to enrollment, transferability, program completion, student and graduate satisfaction, rates of employment in related occupations, continuation toward educational goals, employer satisfaction with graduates, receiving institution satisfaction with transfer students, community service, university research, fiscal management, and system responsiveness. Earlier efforts to develop common definitions for enrollment and funding purposes have been used as a basis upon which to reach common understandings regarding what PIs will be implemented.

Evaluation of Alberta's Proposed Performance Indicators

A review of the 24 expected outcomes indicates the focus will be on economic concerns. Of the 24 expected outcomes for which PIs are being developed, six deal with fiscal issues and eight others use fiscal measures to provide indicators of performance. For example, in order to determine the degree to which community service is perceived to be satisfactory to the general public the proposed PIs intend to use economic impact studies. While an opinion poll might be more appropriate to determine public attitudes on this issue, it appears that the politically correct response may be more likely to occur. Many of the other proposed PIs relate to enrollment, acceptance, transfer, completion, utilization, and satisfaction rates.

In addition to the four types of public postsecondary institutions in Alberta, there are various private postsecondary educational institutions which receive government funds and, therefore, are included within the scope of the accountability net which is to cover "publicly funded learning opportunities" (Alberta Advanced Education, 1994a, p. 16). There are also intra-sectoral distinctions. As has been argued above such differences necessitate different PIs. The department appears to have recognized this need. New Directions acknowledged that Athabasca University, as a distance learning provider, was unique and the department has acknowledged Athabasca University will not be measured by the same PIs as the other universities. The University of Lethbridge, predominantly an undergraduate institution, ought to be evaluated using different standards and means than are used for the two large research universities (University of Calgary and University of Alberta).

Within the college sector there are important differences between institutions on the basis of size, specialization, and location. For example, differences of accessibility and the impact of regional economic conditions ought to be considered when comparing institutional PIs measuring student demand. New Directions, appeared to recognize these differences when it stated that "comparable indicators of performance across sectors will be developed wherever possible, with the distinctive roles and objectives of each sector being respected" (p. 17). The February, 1995 progress report (Alberta Advanced Education, 1995) strengthened the commitment to differential interpretation of PIs. The progress report stated that

> information must be comparable across the system. Performance indicators must be relevant to the goals and objectives of each institution. Institutions must be comparable on the particular performance indicator. For example, it would be inappropriate to compare the province's two technical institutes with smaller regional colleges. (p. 9)

On the other hand, it does not appear that the government of Alberta intends to develop interpretive criteria prior to the implementation PIs. The February 1995 progress report (Alberta Advanced Education, 1995) stated that benchmarks will be established using the data gathered in the first year of implementation. Establishing benchmarks in this way will use current practice as the standard. The interpretative framework being used is historical and norm-referenced rather than criteria-referenced. If all the institutions do an inadequate job in one area the benchmark will be set artificially low and will not provide the incentive for improvement that would be needed.

New Directions proposed that "Albertans will be provided with key indicators of program, service and overall performance" (p. 12) and that "these indicators . . . be published by providers in calendars, annual reports or business plans" (p. 16) in order to address the problem of inadequate information available to students. However, the issue of providing a context for the interpretation of the information appears to remain unresolved. Institutions may find themselves attracting the wrong students because of the enforced reporting if no interpretive context is provided. The degree to which performance conforms to the institutions goals needs to be communicated if the information is to be meaningful. Without the goals and outcomes being contrasted student dissatisfaction may result. That dissatisfaction will result in poorer PI results which will be regarded by government as poor performance. The institution ultimately gets penalized for attracting dissatisfied students, whom it did not want to attract but who came because of the enforced publication of information without that information being placed in the context of the institution's mission.

Alberta Advanced Education and Career Development (1995) indicated PIs are to "provide Albertans with the information necessary to evaluate the overall success of the post-secondary sector in ensuring an accessible, responsive and affordable system of quality learning opportunities" (p. 10). The ultimate measure of quality for higher education is whether adults are developing the skills, knowledge, and attitudes which they desire and need. In light of this purpose this intention is laudable. However, the rhetoric appears to be stronger than action. The proposed PIs for the 24 expected outcomes agreed to in December 1994 fall short of reflecting whether there is a "system of quality learning opportunities" because PIs which might show the "value-added" (to

use Astin's, 1991, phrase) by the learning experiences of the students are not attempted. Satisfaction of students, employers, and receiving institutions will give some indication of the perceived benefit of the learning experience, but these measures are inadequate to indicate the degree to which learning goals of students, employers, or the postsecondary institutions themselves are being met.

Conclusion

The mechanical, medical , and economic metaphors are helpful in analyzing the proposed PI system in Alberta. The government's economic approach is reflected in the historically comparative nature of many of the proposed PIs for Alberta's postsecondary education system.

Alberta's experience in developing a PI system for a multi-sector postsecondary education system reinforces the inherent difficulties in such an endeavor. The Alberta approach, despite (or, perhaps, because of) using a consultative development process, appears to be heavily weighted toward the economic metaphor.

The government needs to be commended for recognizing the inherent problems with trying to develop a comprehensive PI system which will be fully transferable between and within sectors. However, the department does not seem to have realized the inability of an economic style PI system to reflect the true nature of institutional achievement in relation to educational goals.

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